Groundwater Policy Discussion: New Allocation Technical Review

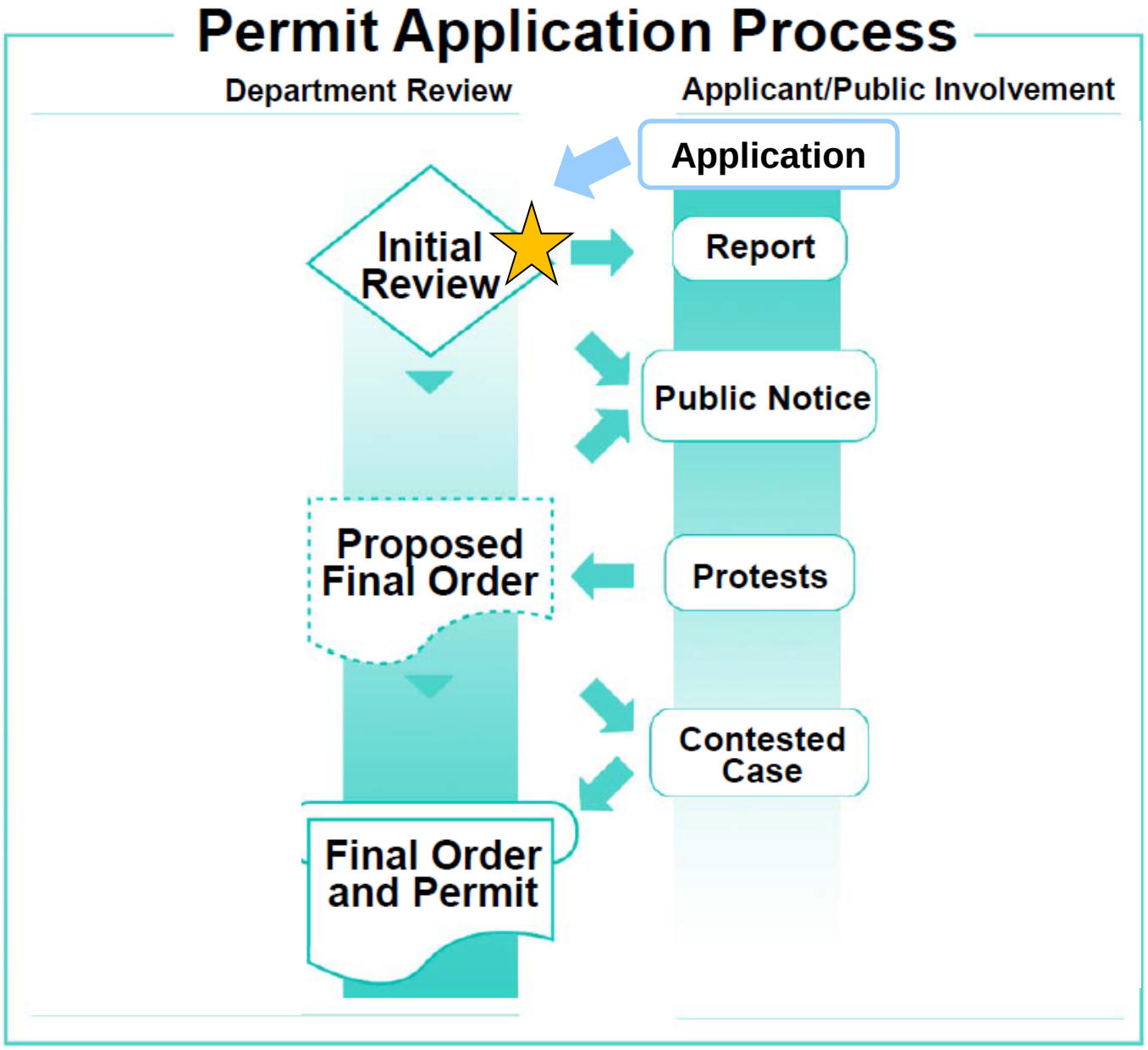
Oregon Water Resources Commission
August 18, 2017

Douglas Woodcock, Deputy Director
Brenda Bateman, Technical Services Division Administrator
Justin Iverson, Groundwater Section Manager

Introduction

- **IWRS and agency strategic plan will set themes and priorities that guide a near-term groundwater work plan**
- **Staff, commissioners, and stakeholders continue to discuss groundwater management priorities**
- **This presentation provides a baseline for continuing discussions of groundwater policy with the Commission**

GW Technical Review in Context



Public Interest Presumption

The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health, as described in ORS 537.525 if:

(OAR 690-310-130)

Public Interest Presumption

a) Allowed in the Basin Plan
b) Water is available (for further appropriation)
c) Will not injure existing water rights
d) Complies with the rules of the Commission

(OAR 690-310-130)

GW Technical Review Form

PUBLIC INTEREST REVIEW FOR GROUNDWATER APPLICATIONS

TO: Water Rights Section Date _____
FROM: Groundwater Section _____
Reviewer's Name
SUBJECT: Application G- _____ Supersedes review of _____
Date of Review(s)

PUBLIC INTEREST PRESUMPTION; GROUNDWATER

OAR 690-310-130 (1) *The Department shall presume that a proposed groundwater use will ensure the preservation of the public welfare, safety and health as described in ORS 537.525.* Department staff review groundwater applications under OAR 690-310-140 to determine whether the presumption is established. OAR 690-310-140 allows the proposed use be modified or conditioned to meet the presumption criteria. **This review is based upon available information and agency policies in place at the time of evaluation.**

A. GENERAL INFORMATION: Applicant's Name: _____ County: _____

A1. Applicant(s) seek(s) _____ cfs from _____ well(s) in the _____ Basin, _____ subbasin

A2. Proposed use _____ Seasonality: _____

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1						
2						
3						
4						
5						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type

GW Technical Review Form

Four sections:

A. **Information pertinent to the technical review**

B. **Groundwater availability public interest review (Division 310)**

C. **Hydraulic connection between groundwater and surface water (Division 9)**

D. **Compliance with well construction regulations (Divisions 200 – 230)**

Section A: General Information

- **Capture essential groundwater information assessed during the technical review**
- **Research available information**

A1. Applicant(s) seek(s) 0.2 cfs from 2 well(s) in the Willamette Basin, Middle Willamette subbasin

A2. Proposed use Industrial / Fire Suppression Seasonality: Year-round

A3. Well and aquifer data **(attach and number logs for existing wells; mark proposed wells as such under logid)**:

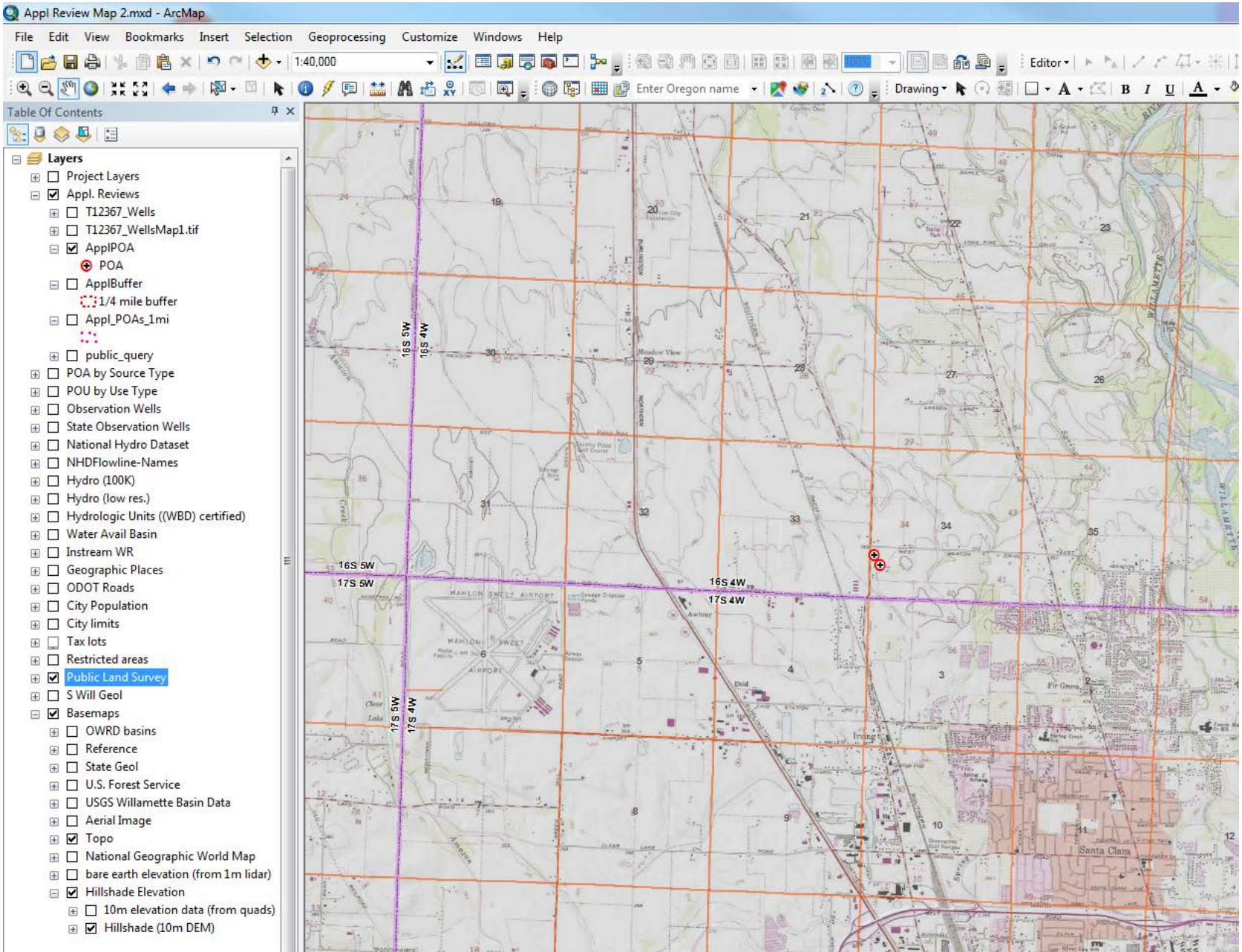
Well	Logid	Applicant's Well #	Proposed Aquifer*	Proposed Rate(cfs)	Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
1	LANE 8305	1	Alluvium	0.13	16S/04W-34 SWSW	1472'N, 232'E of SW cor S34
2	LANE 1965	2	Alluvium	0.07	16S/04W-34 SWSW	1134'N, 413'E of SW cor S34
3						

* Alluvium, CRB, Bedrock

Well	Well Elev ft msl	First Water ft bls	SWL ft bls	SWL Date	Well Depth (ft)	Seal Interval (ft)	Casing Intervals (ft)	Liner Intervals (ft)	Perforations Or Screens (ft)	Well Yield (gpm)	Draw Down (ft)	Test Type
1	370	6	6	03/17/1982	40	0-19	+1-39		34-39	60		A
2	370	28	5	3/11/1991	39	0-19	+1-39		28-31	30		A

Use data from application for proposed wells.

Section A: General Information



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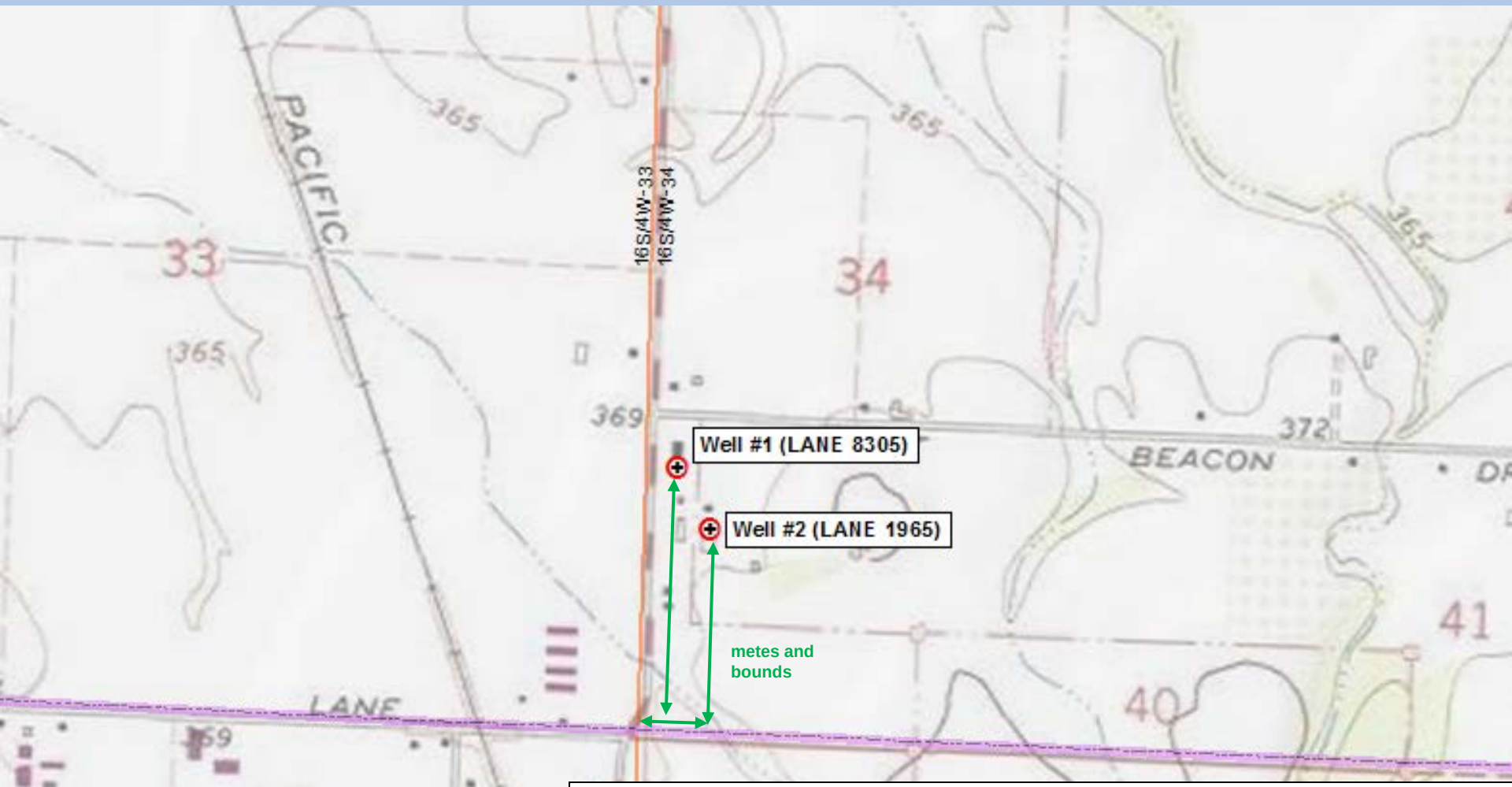

Location (T/R-S QQ-Q)	Location, metes and bounds, e.g. 2250' N, 1200' E fr NW cor S 36
16S/04W-34 SWSW	1472'N, 232'E of SW cor S34
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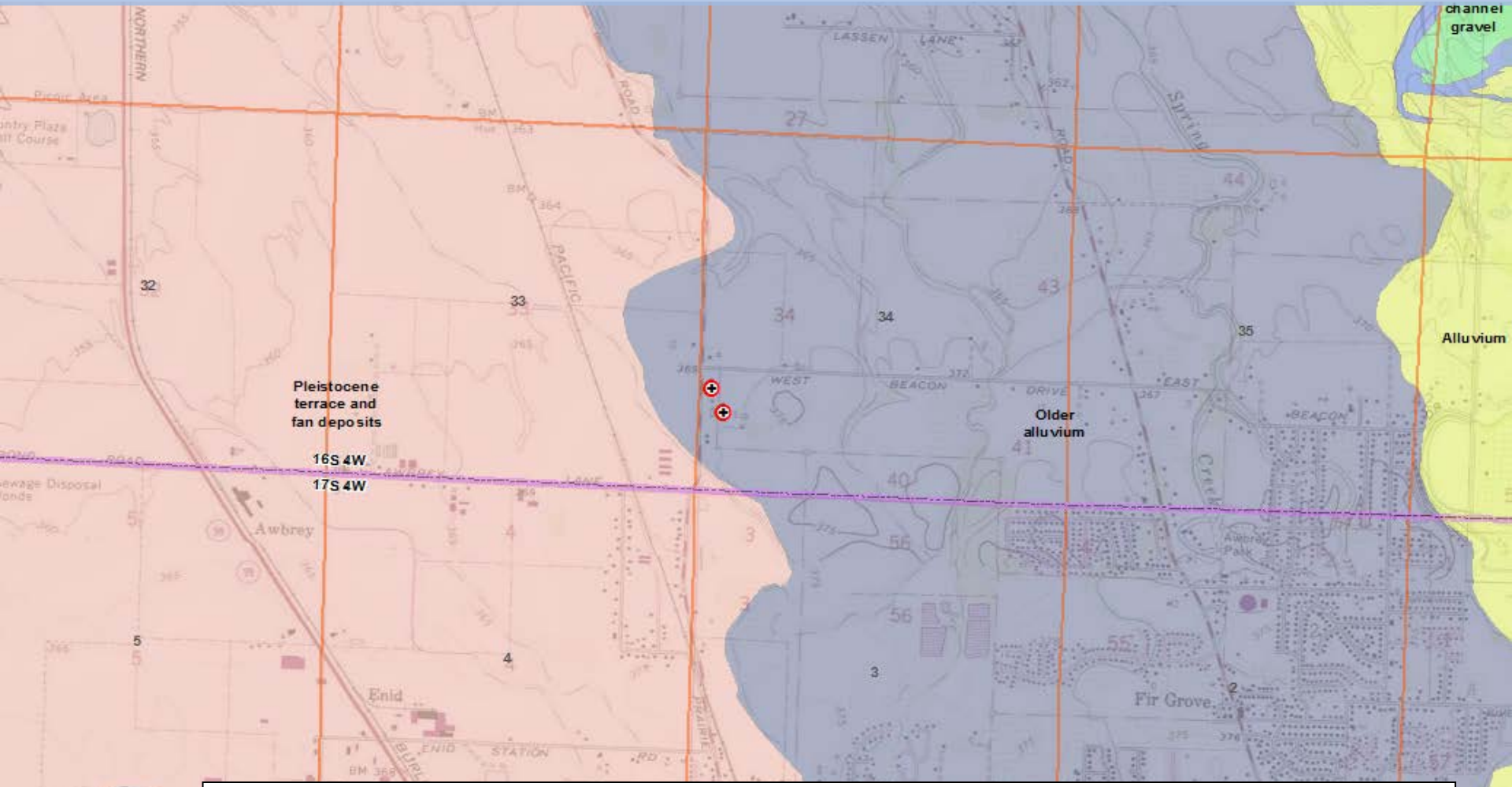
Section A: General Information



Well	Aquifer or Proposed Aquifer
1	**Shallow Alluvium of Willamette Valley**
2	**Shallow Alluvium of Willamette Valley**

Section A: General Information

- **Geology and Hydrogeology**
  - **Aquifer Description**

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Shallow Alluvium of Willamette Valley**	☐	☒
2	**Shallow Alluvium of Willamette Valley**	☐	☒
		☐	☐

Basis for aquifer confinement evaluation: *SWL*s reported on well logs* for the applicant's wells are approx. equal to reported *First Water*; well logs for similarly constructed well in the area also show *SWL*s coincident with *First Water*.

*The applicant's Well #2 (LANE 1965) reports *First Water* at 28 ft depth. However, Well #2 is constructed very similar to Well #1 and reports similar *SWL* so the reviewer assumes that *First Water* reported on the well log for Well #2 does not represent the actual shallowest water-bearing zone and that both wells are producing from unconfined zones within the aquifer.

Section A: General Information

State of Oregon
Oregon Department of Geology and Mineral Industries
Vicki S. McConnell, State Geologist

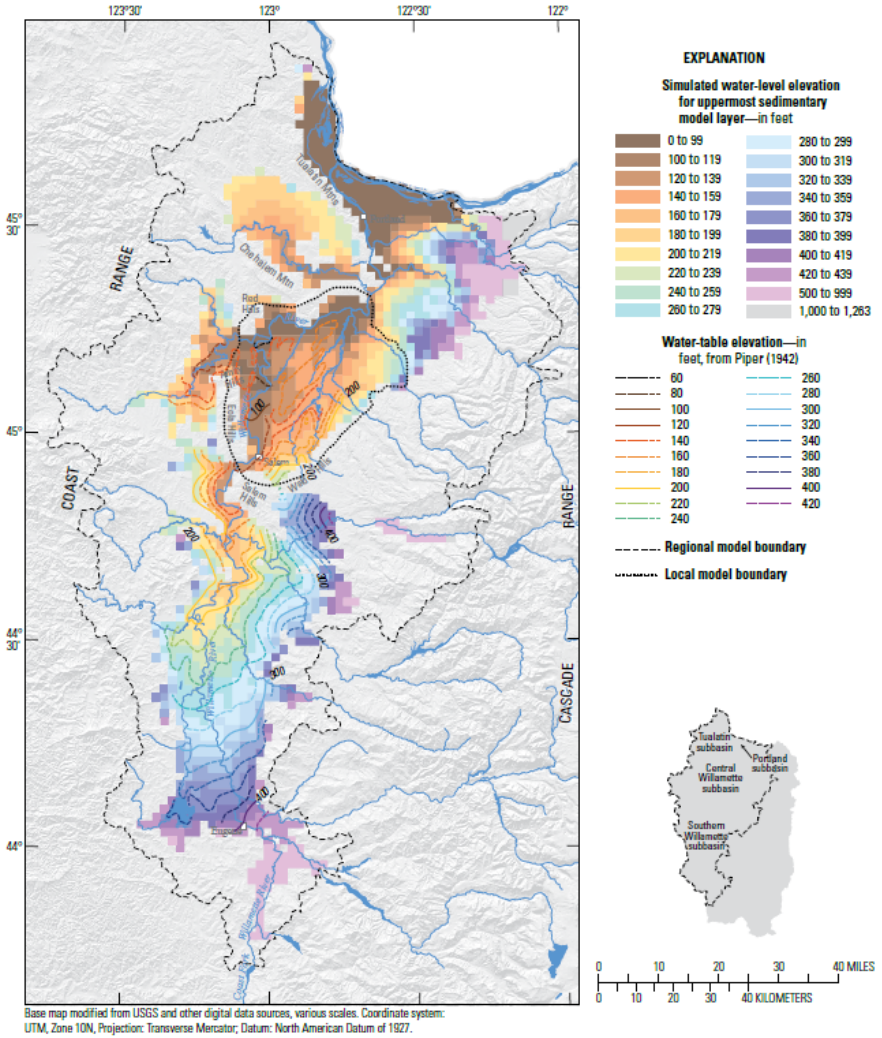
OPEN FILE REPORT O-10-03

DIGITAL GEOLOGIC MAP OF THE SOUTHERN WILLAMETTE VALLEY, BENTON, LANE, LINN, MARION, AND POLK COUNTIES, OREGON

By Jason D. McClaughry[1], Thomas J. Wiley[2], Mark L. Ferns[1], and Ian P. Madin[2]

2010

[1] Oregon Department of Geology and Mineral Industries, Baker City Field Office, Baker County Courthouse, 1995 3rd Street, Suite 130, Baker City, Oregon 97814
[2] Oregon Department of Geology and Mineral Industries, 800 NE Oregon Street, #28, Suite 965, Portland, Oregon 97232



Base map modified from USGS and other digital data sources, various scales. Coordinate system: UTM, Zone 10N, Projection: Transverse Mercator; Datum: North American Datum of 1927.

Figure 35. Simulated pre-development (scenario RSS1) water-level elevation for the uppermost sedimentary model layer (Willamette silt unit, upper sedimentary unit, middle sedimentary unit, or lower sedimentary unit) compared with 1935 pre-development water-table elevations of Piper (1942), Willamette Basin, Oregon.

Section A: General Information

- **Basin and groundwater administrative area rules and restrictions**

A5. ☒ **Provisions of the** Willamette (OAR 690-502) Basin rules relative to the development, classification and/or management of groundwater hydraulically connected to surface water ☐ **are**, *or* ☒ **are not**, activated by this application. (Not all basin rules contain such provisions.)
Comments: The proposed POAs produce from an unconfined aquifer but are not hydraulically connected to surface waters within ¼ mile.

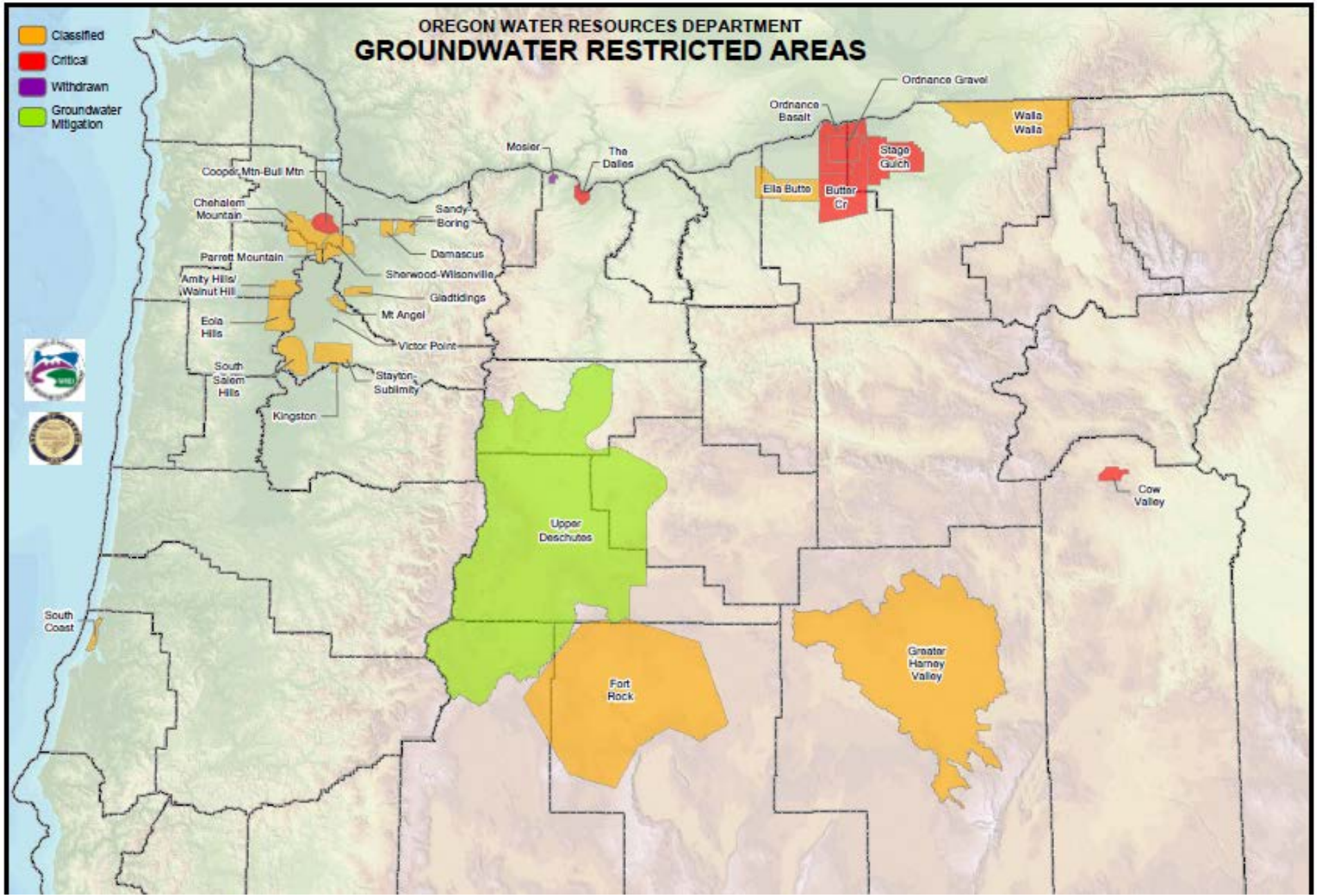
690-502-0240

Groundwater-Surface Water Hydraulic Connection

These rules are in addition to the requirements of OAR chapter 690, division 009. Groundwater in unconfined alluvium within 1/4 mile of the banks of a stream or surface water source is presumed to be in hydraulic connection with the surface water source, unless the applicant or appropriator provides satisfactory information or demonstration to the contrary. This hydraulically connected groundwater shall be classified the same as the surface source. This section shall not apply to those groundwater uses exempted by ORS 537.545. Notwithstanding such classification, permits may be issued for the use of water from a well in an unconfined aquifer that is hydraulically connected to groundwater, within a quarter mile of a stream, provided that surface water impacts are mitigated through storage releases.

Stat. Auth.: ORS 536 & ORS 537
Stats. Implemented:
Hist.: WRD 3-2003, f. & cert. ef. 12-4-03, Renumbered from 690-502-0160

Section A: General Information



Section B: Groundwater Availability

a. Over-appropriation

b. Injury

c. Capacity

d. Protective Conditions

Narrative

B. GROUNDWATER AVAILABILITY CONSIDERATIONS, OAR 690-310-130, 400-010, 410-0070

B1. **Based upon available data**, I have determined that groundwater* for the proposed use:

a. ☐ **is** over appropriated, ☒ **is not** over appropriated, *or* ☐ **cannot be determined to be** over appropriated during any period of the proposed use. * This finding is limited to the groundwater portion of the over-appropriation determination as prescribed in OAR 690-310-130;

b. ☐ **will not** *or* ☐ **will** likely be available in the amounts requested without injury to prior water rights. * This finding is limited to the groundwater portion of the injury determination as prescribed in OAR 690-310-130;

c. ☐ **will not** *or* ☐ **will** likely to be available within the capacity of the groundwater resource; or

d. ☒ **will, if properly conditioned**, avoid injury to existing groundwater rights or to the groundwater resource:
   i. ☒ The permit should contain condition #(s) **7C (7-year SWL); Medium Water-Use Reporting**;
   ii. ☐ The permit should be conditioned as indicated in item 2 below.
   iii. ☐ The permit should contain special condition(s) as indicated in item 3 below;

B2. a. ☐ **Condition** to allow groundwater production from no deeper than _____ ft. below land surface;

b. ☐ **Condition** to allow groundwater production from no shallower than _____ ft. below land surface;

c. ☐ **Condition** to allow groundwater production only from the _____ groundwater reservoir between approximately _____ ft. and _____ ft. below land surface;

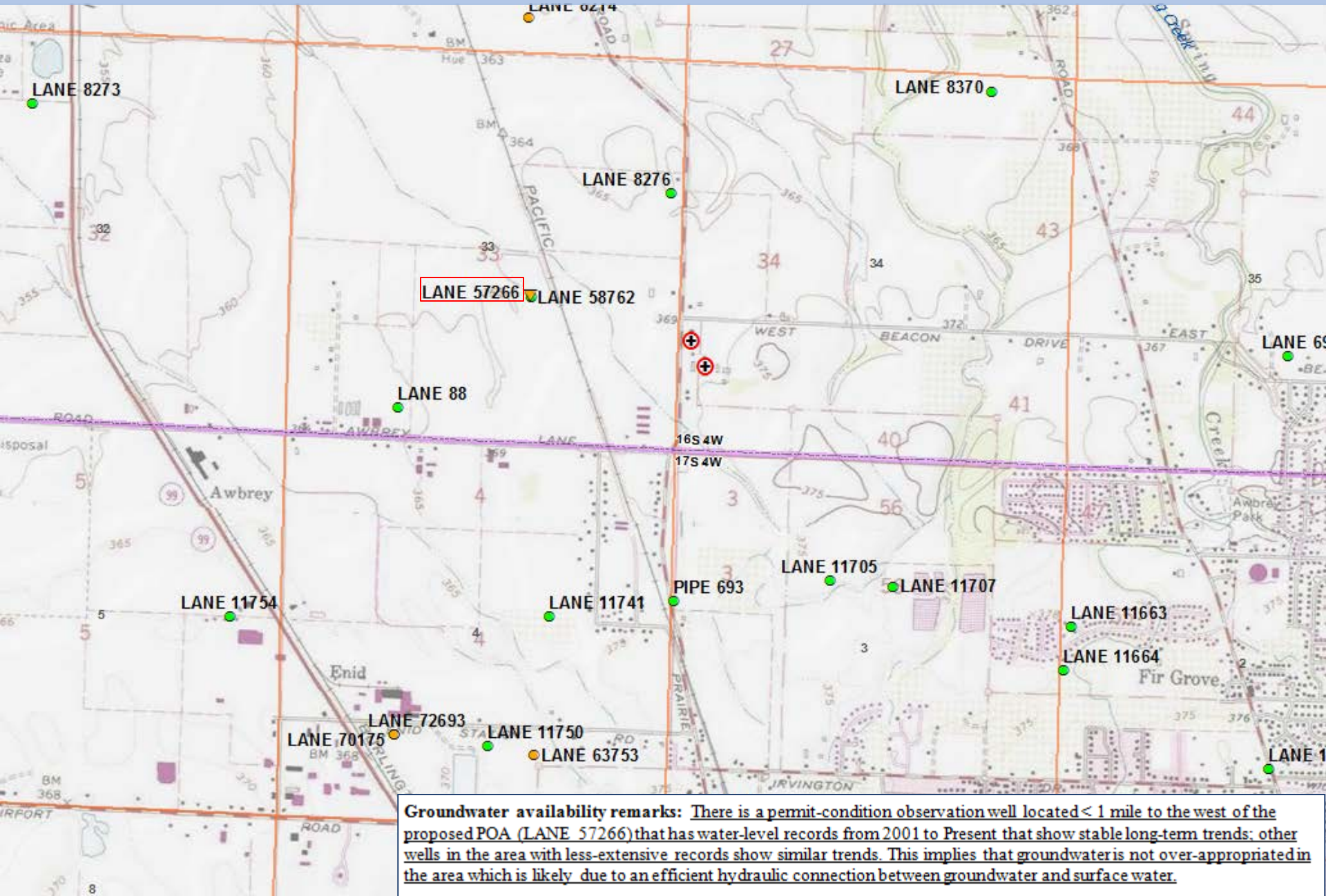
d. ☐ **Well reconstruction** is necessary to accomplish one or more of the above conditions. The problems that are likely to occur with this use and without reconstructing are cited below. Without reconstruction, I recommend withholding issuance of the permit until evidence of well reconstruction is filed with the Department and approved by the Groundwater Section.

Describe injury –as related to water availability– that is likely to occur without well reconstruction (interference w/ senior water rights, not within the capacity of the resource, etc): _____

B3. **Groundwater availability remarks:** There is a permit-condition observation well located < 1 mile to the west of the proposed POA (LANE 57266) that has water-level records from 2001 to Present that show stable long-term trends; other wells in the area with less-extensive records show similar trends. This implies that groundwater is not over-appropriated in the area which is likely due to an efficient hydraulic connection between groundwater and surface water.

There are a few permitted groundwater PODs in the vicinity of the proposed POA and most wells in the area are similarly constructed to produce from the shallow alluvial material in the upper part of the basin-fill sediments (~70% of wells in the area are completed to < 50 ft). Given the unconfined nature of the aquifer, the thickness of the sediments (part of the Eugene Fan), and relatively high productivity of the aquifer (i.e., high K, high T), interference to nearby groundwater users will likely be insignificant to minor.

Section B: Groundwater Availability



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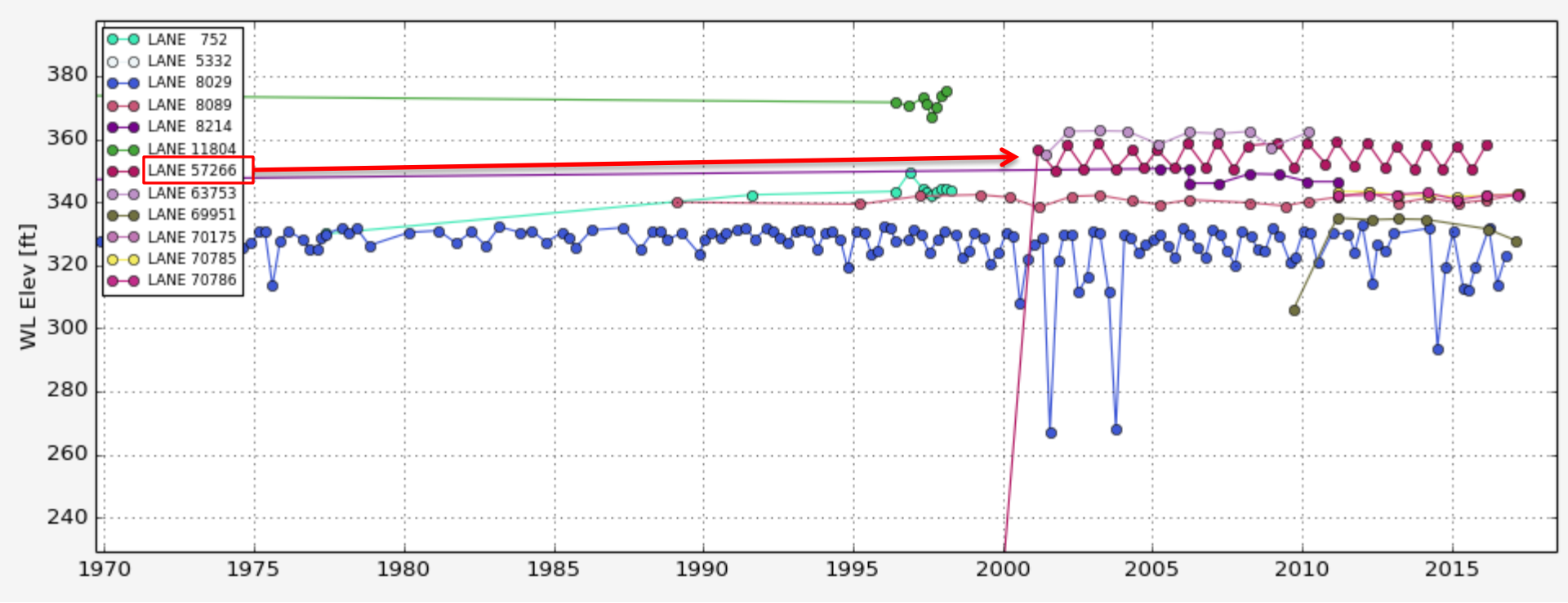

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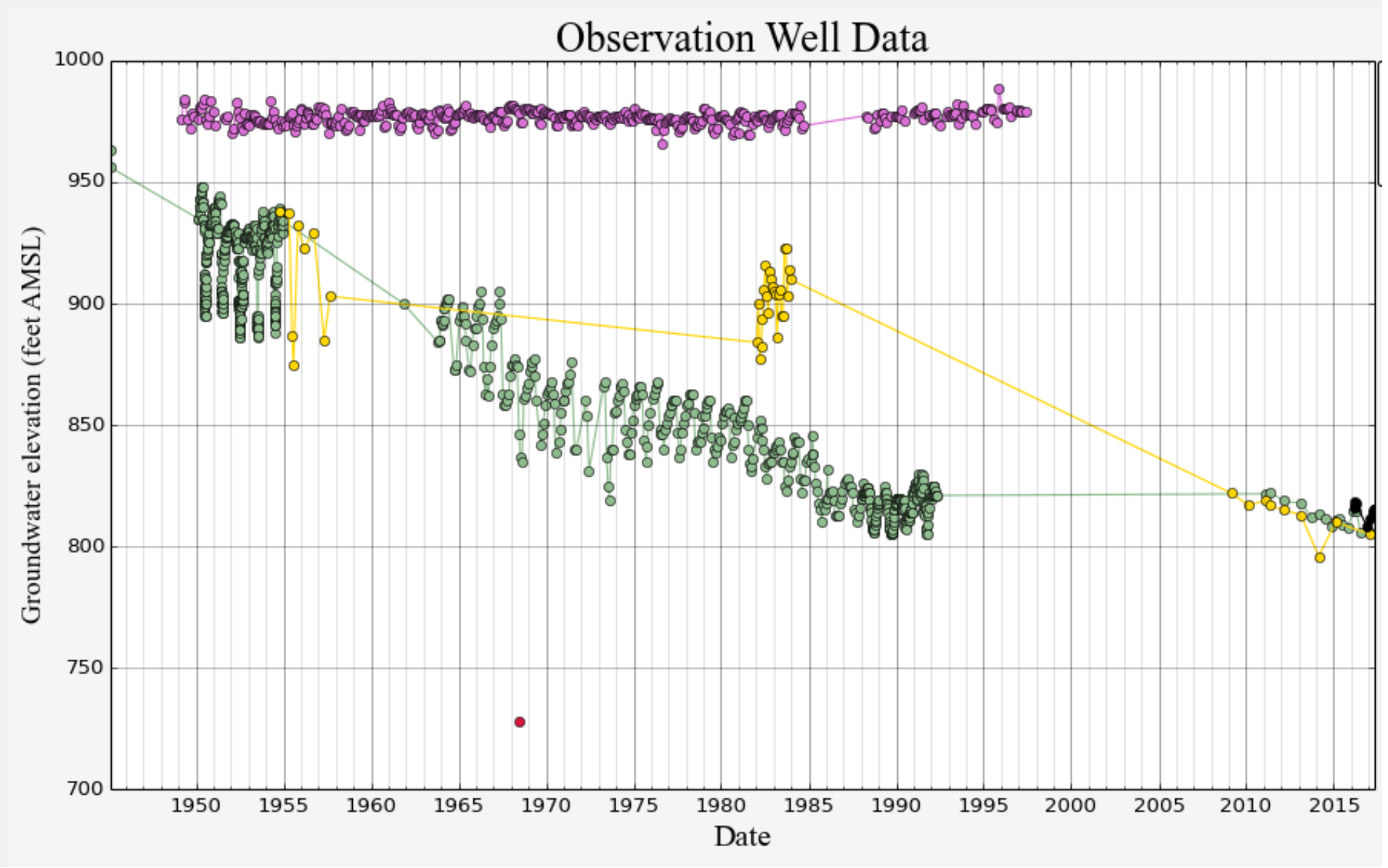

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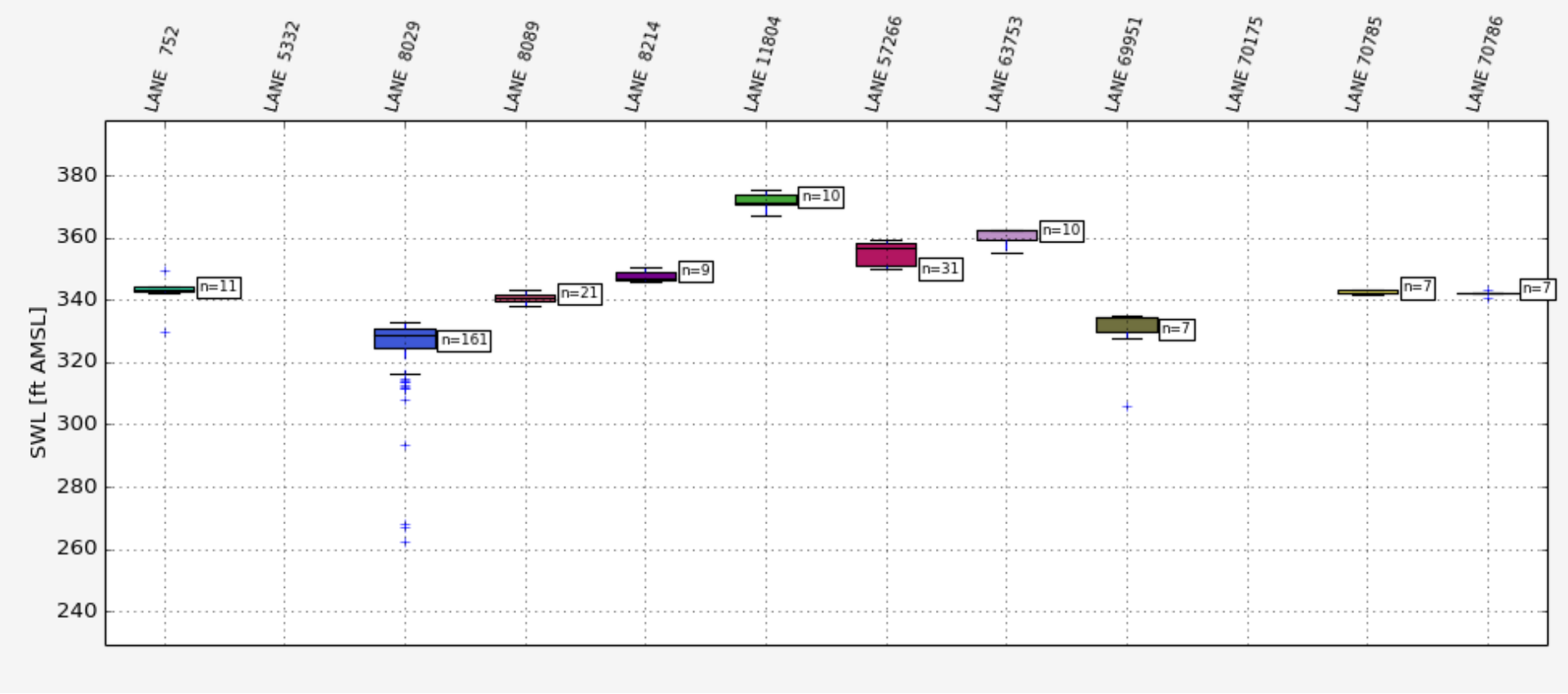

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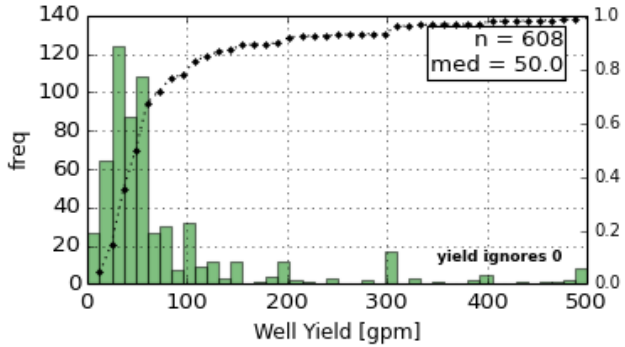

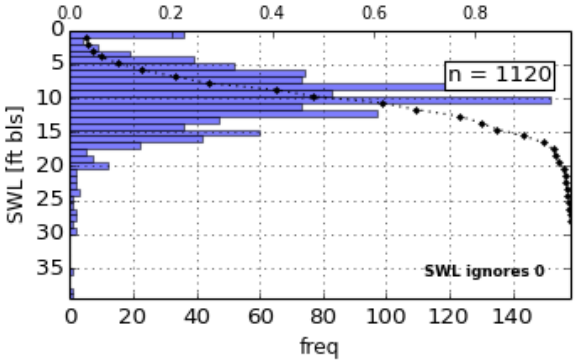

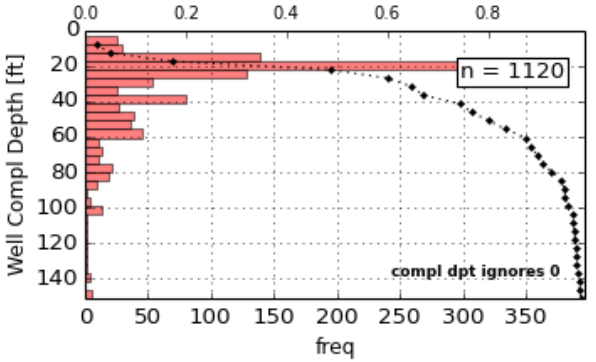

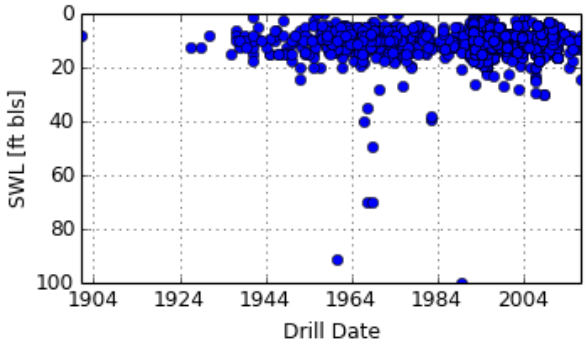

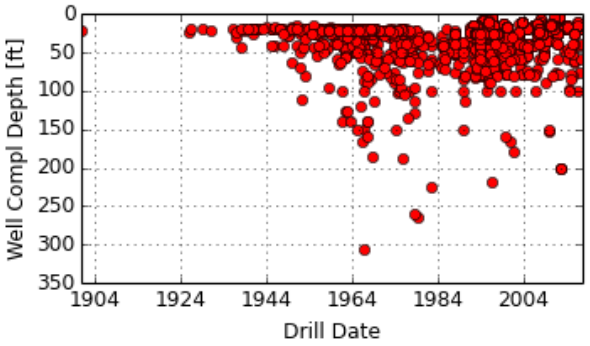

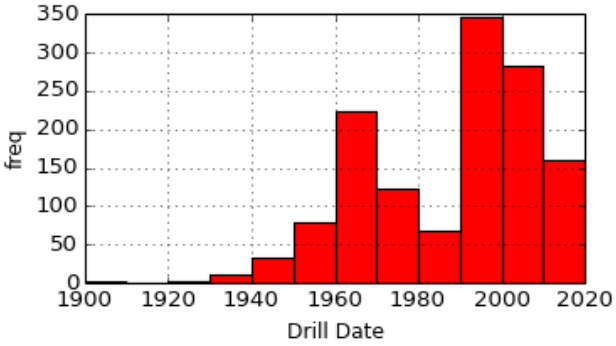

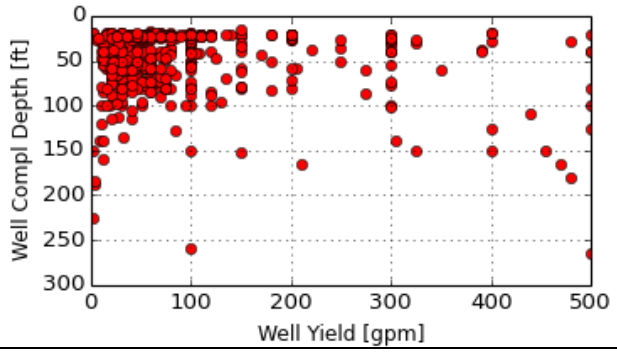

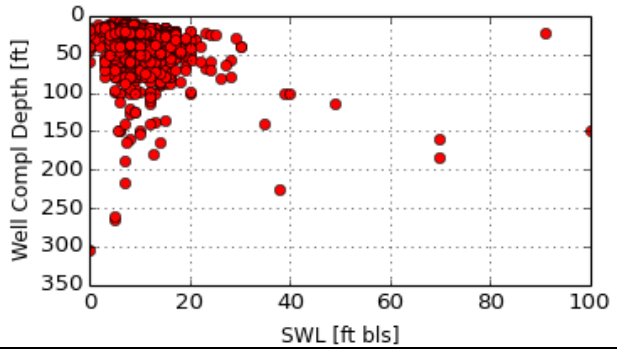

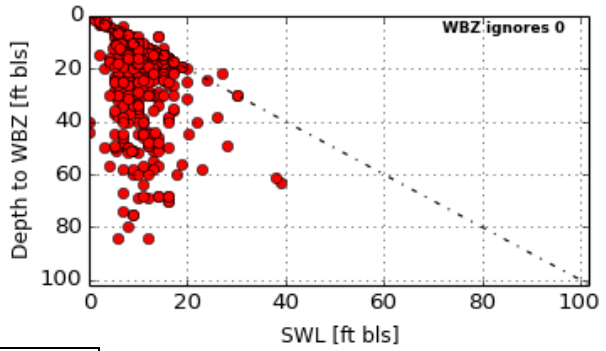

There are a few permitted groundwater PODs in the vicinity of the proposed POA and most wells in the area are similarly constructed to produce from the shallow alluvial material in the upper part of the basin-fill sediments (~70% of wells in the area are completed to < 50 ft). Given the unconfined nature of the aquifer, the thickness of the sediments (part of the Eugene Fan), and relatively high productivity of the aquifer (i.e., high K, high T), interference to nearby groundwater users will likely be insignificant to minor.

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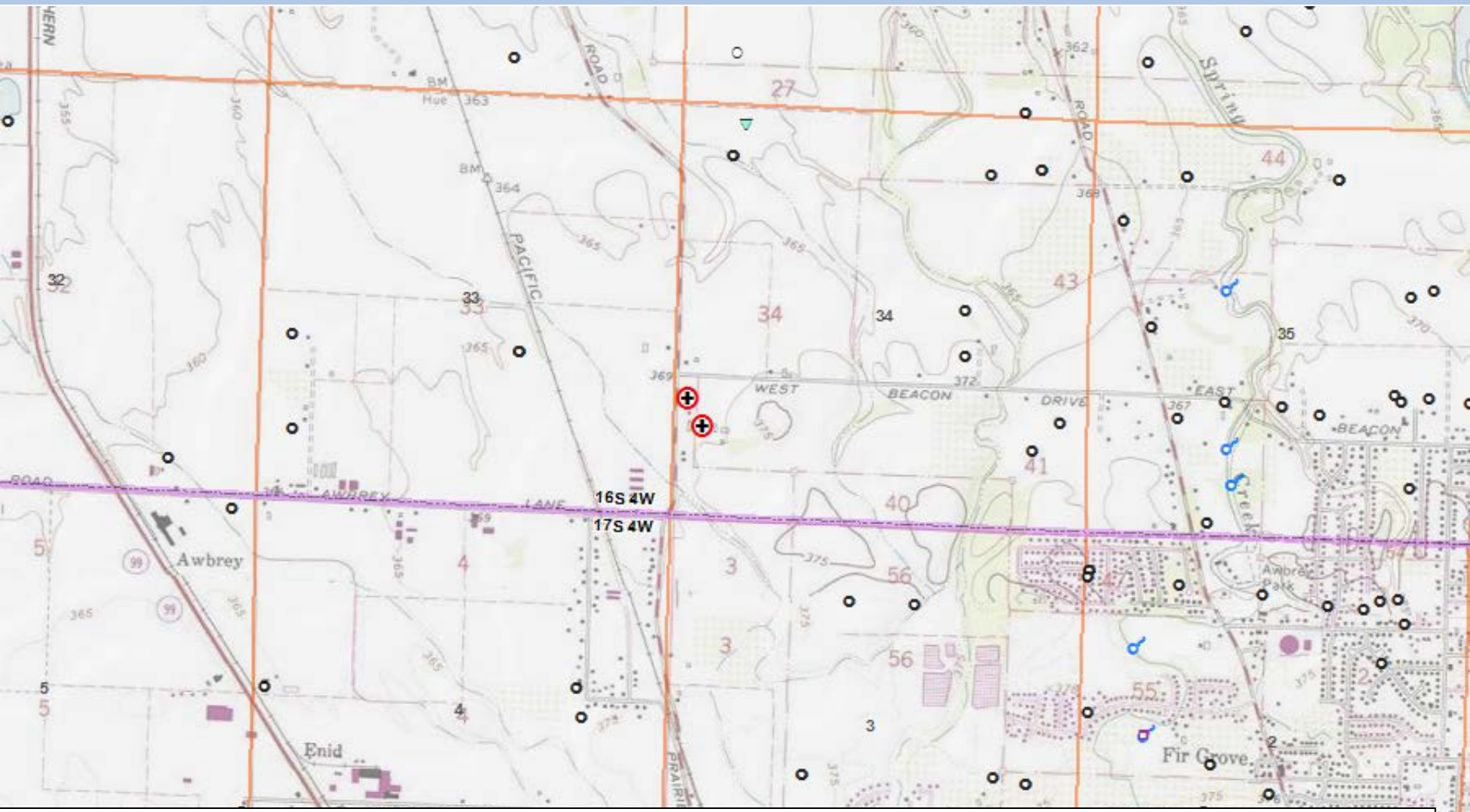

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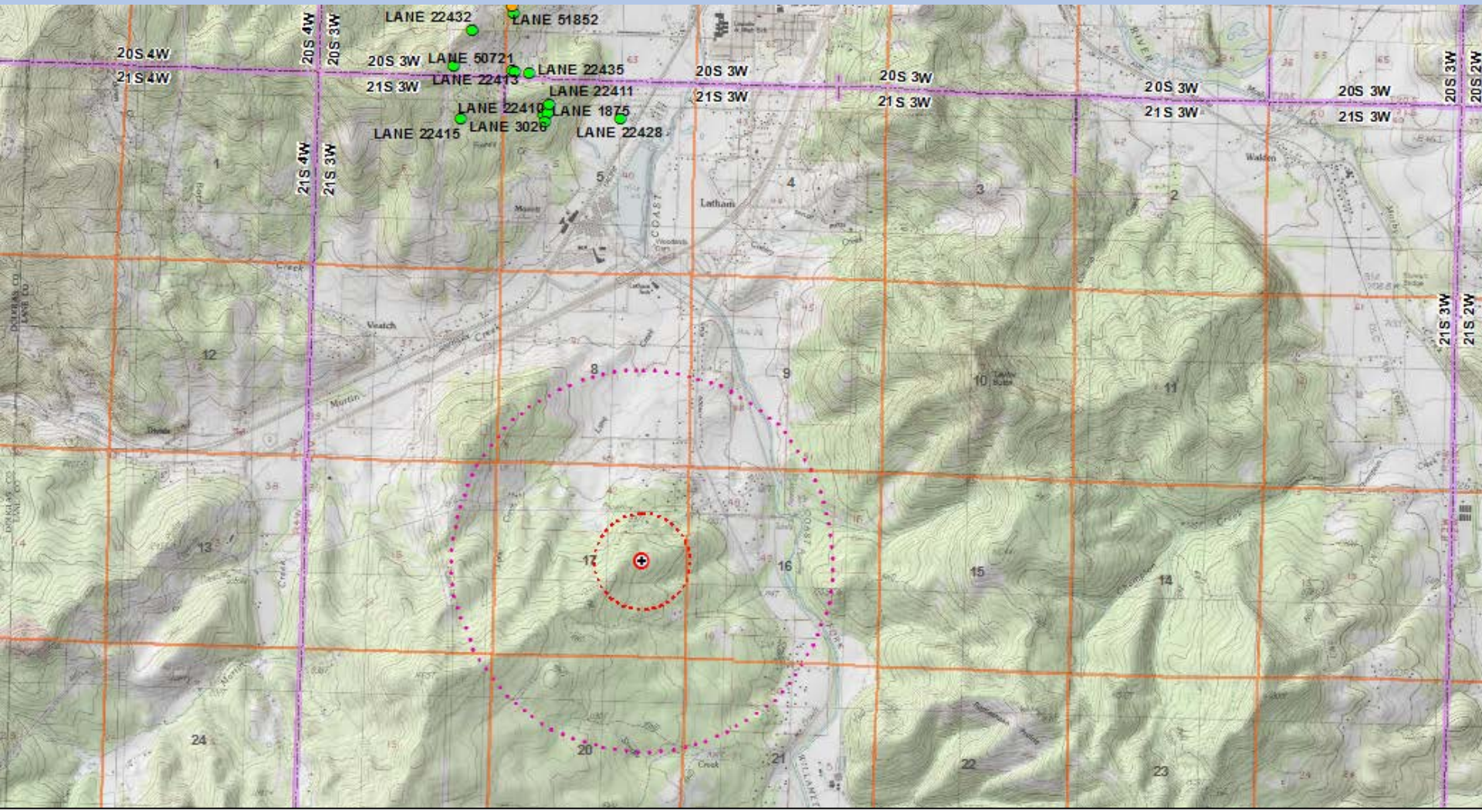
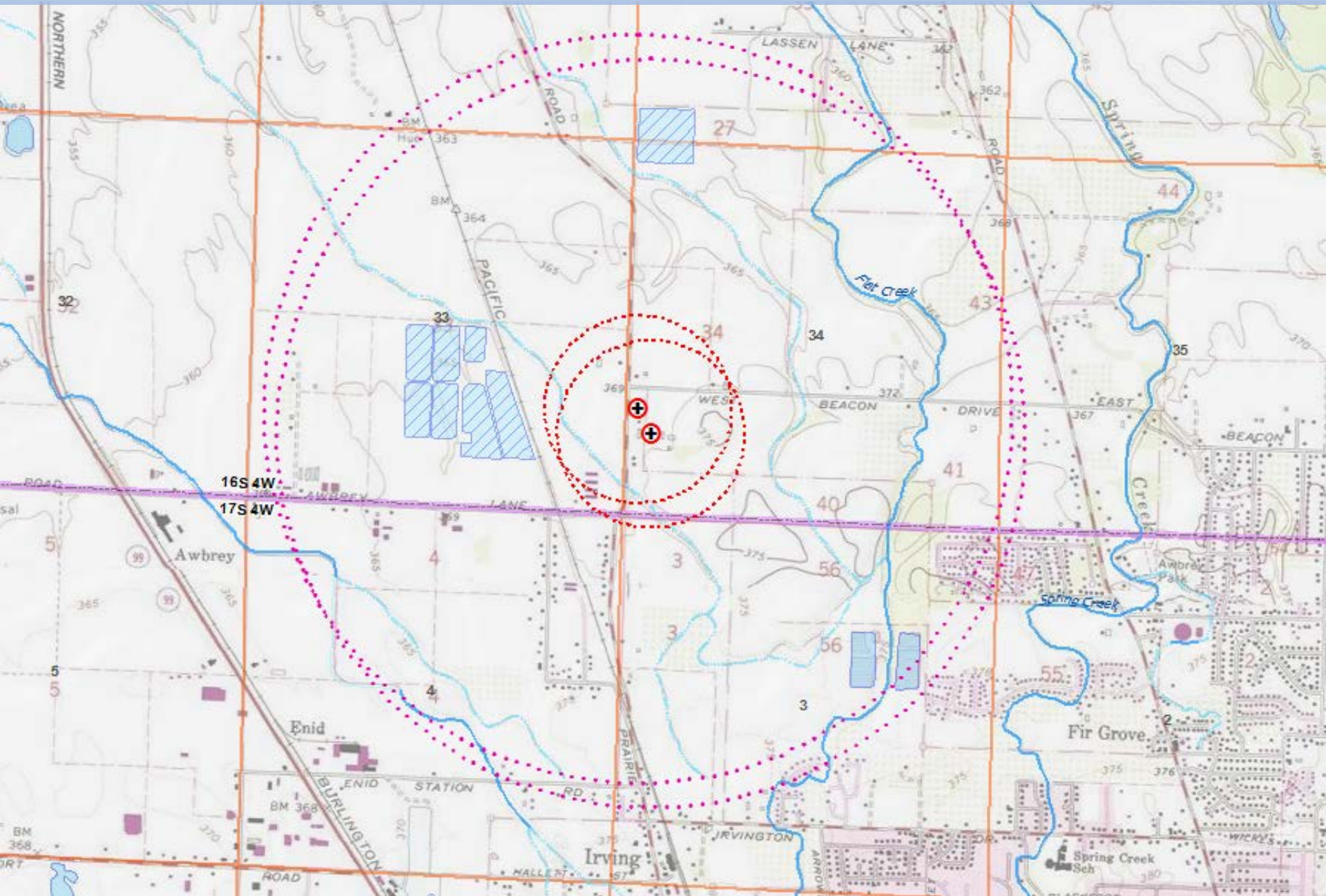


Groundwater availability remarks: The applicant's proposed POA is located in an area where there has been little groundwater development – mostly semi-forested, rural landscape. The closest well that OWRD has water level data on is located over 3 miles to the north and likely in a separate aquifer. The nearest permitted groundwater POA is over 2 miles away and will likely not experience any impacts from the proposed use. Domestic well use in the immediate area is also fairly low and mostly restricted to lower in the valley of the Coast Fork Willamette River.

Section C: GW/SW Interaction



Section C: GW/SW Interaction

- **Aquifer Type and Hydraulic Connection**

C. GROUNDWATER/SURFACE WATER CONSIDERATIONS, OAR 690-09-040

C1. **690-09-040 (1):** Evaluation of aquifer confinement:

Well	Aquifer or Proposed Aquifer	Confined	Unconfined
1	**Shallow Alluvium of Willamette Valley**	☐	☒
2	**Shallow Alluvium of Willamette Valley**	☐	☒
		☐	☐

Basis for aquifer confinement evaluation: *SWL*s reported on well logs* for the applicant's wells are approx. equal to reported *First Water*; well logs for similarly constructed well in the area also show *SWL*s coincident with *First Water*.

*The applicant's Well #2 (LANE 1965) reports *First Water* at 28 ft depth. However, Well #2 is constructed very similar to Well #1 and reports similar *SWL* so the reviewer assumes that *First Water* reported on the well log for Well #2 does not represent the actual shallowest water-bearing zone and that both wells are producing from unconfined zones within the aquifer.

C2. **690-09-040 (2) (3):** Evaluation of distance to, and hydraulic connection with, surface water sources. All wells located a horizontal distance less than ¼ mile from a surface water source that produce water from an unconfined aquifer shall be assumed to be hydraulically connected to the surface water source. Include in this table any streams located beyond one mile that are evaluated for PSI.

Well	SW #	Surface Water Name	GW Elev ft msl	SW Elev ft msl	Distance (ft)	Hydraulically Connected? YES	NO	ASSUMED	Potential for Subst. Interfer. Assumed? YES	NO
1	1	**Spring Creek**	**365**	**360-365**	**6940**	☒	☐	☐	☐	☒
2	1	**Spring Creek**	**365**	**360-365**	**6650**	☒	☐	☐	☐	☒
						☐	☐	☐	☐	☐

Basis for aquifer hydraulic connection evaluation: GW elevations are estimated to be similar to or above SW elevations suggesting that groundwater is flowing towards and discharging to surface water

Water Availability Basin the well(s) are located within: Willamette R > Columbia R – AB Periwinkle Cr At Gage 14174

Section C: GW/SW Interaction

- **Potential for Substantial Interference (PSI)**

C3a. **690-09-040(4):** Evaluation of stream impacts for each well that has been determined or assumed to be **hydraulically connected and less than 1 mile** from a surface water source. Limit evaluation to instream rights and minimum stream flows that are pertinent to that surface water source, and not lower SW sources to which the stream under evaluation is tributary. Compare the requested rate against the 1% of 80% *natural* flow for the pertinent Water Availability Basin (WAB). If Q is not distributed by well, use full rate for each well. Any checked ☒ box indicates the well is assumed to have the potential to cause PSI.

Well	SW #	Well < ¼ mile?	Qw > 5 cfs?	Instream Water Right ID	Instream Water Right Q (cfs)	Qw > 1% ISWR?	80% Natural Flow (cfs)	Qw > 1% of 80% Natural Flow?	Interference @ 30 days (%)	Potential for Subst. Interfer. Assumed?
1	1	☐	☐	MF181A	1500.00	☐	4890.00	☐	<25%	☐
1	2	☐	☐	IS69796A	100.00	☐	134.00	☐	<25%	☐
1	3	☐	☐	IS69998A	40.00	☐	67.90	☐	<25%	☐

Comments: C3a: The requested allocation (0.25 cfs) is much less than 1% of relevant flows in both SW1 and SW2, and somewhat less than in SW3 (although the latter is likely immaterial because the relevant portion of SW3 (Pudding River) is limited to a very small reach near its confluence with SW2 (Molalla River); furthermore, most if not all, stream interference will be with the two nearer streams).

The Hunt 2003 analytical stream depletion model was used to estimate pumping interference at 30 days at SW1 (Willamette River). Model results indicate that interference is expected to be less than 25% of the maximum allocated pumping rate at 30 days.

Section C: GW/SW Interaction

Water Availability Analysis
Detailed Reports

WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CR AT GAGE 14174
WILLAMETTE BASIN

Water Availability as of 8/17/2017

Watershed ID #: 30200321 (Map)
Date: 8/17/2017

Exceedance Level: 80%
Time: 7:31 AM

Water Availability Calculation | Consumptive Uses and Storages | Instream Flow Requirements | Reservations | Water Rights | Watershed Characteristics

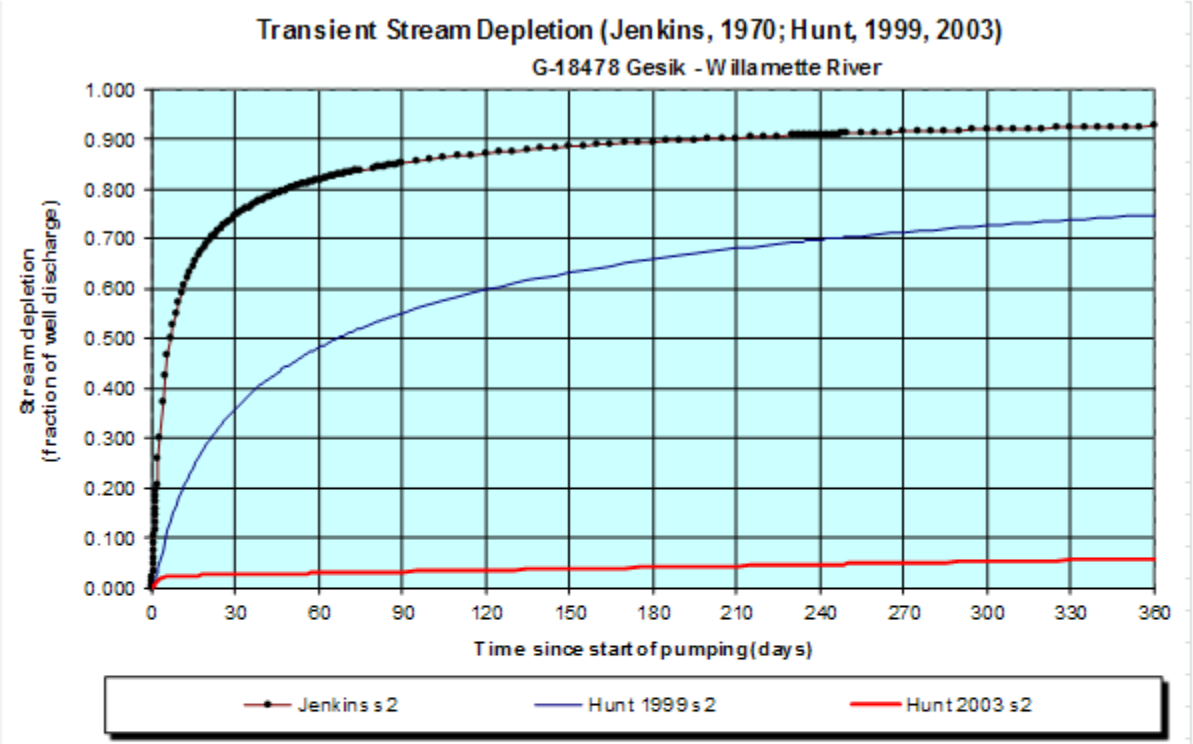
Water Availability Calculation

Monthly Streamflow in Cubic Feet per Second
Annual Volume at 50% Exceedance in Acre-Feet

Month	Natural Stream Flow	Consumptive Uses and Storages	Expected Stream Flow	Reserved Stream Flow	Instream Flow Requirement	Net Water Available
JAN	10,100.00	1,370.00	8,730.00	0.00	1,750.00	6,980.00
FEB	11,600.00	4,290.00	7,310.00	0.00	1,750.00	5,560.00
MAR	11,000.00	4,560.00	6,440.00	0.00	1,750.00	4,690.00
APR	9,760.00	4,260.00	5,500.00	0.00	1,750.00	3,750.00
MAY	8,430.00	2,540.00	5,890.00	0.00	1,750.00	4,140.00
JUN	5,360.00	855.00	4,500.00	0.00	1,750.00	2,750.00
JUL	3,270.00	661.00	2,610.00	0.00	1,750.00	859.00
AUG	2,560.00	601.00	1,960.00	0.00	1,750.00	209.00
SEP	2,540.00	517.00	2,020.00	0.00	1,750.00	273.00
OCT	2,860.00	269.00	2,590.00	0.00	1,750.00	841.00
NOV	4,170.00	354.00	3,820.00	0.00	1,750.00	2,070.00
DEC	8,150.00	379.00	7,770.00	0.00	1,750.00	6,020.00
ANN	7,460,000.00	1,240,000.00	6,230,000.00	0.00	1,270,000.00	4,960,000.00

Download Data (Text - Formatted , Text - Tab Delimited , Excel)

Section C: GW/SW Interaction



Output for Stream Depletion, Scenerio 2 (s2):						Time pump on (pumping duration) = 365 days						
Days	30	60	90	120	150	180	210	240	270	300	330	360
J SD	74.4%	81.7%	85.0%	87.0%	88.4%	89.4%	90.2%	90.8%	91.3%	91.8%	92.2%	92.5%
H SD 1999	35.8%	48.1%	55.0%	59.7%	63.1%	65.8%	67.9%	69.7%	71.2%	72.5%	73.7%	74.7%
H SD 2003	2.57%	2.87%	3.16%	3.46%	3.75%	4.04%	4.33%	4.63%	4.92%	5.21%	5.50%	5.80%
Qw, cfs	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250	0.250
H SD 99, cfs	0.090	0.120	0.138	0.149	0.158	0.164	0.170	0.174	0.178	0.181	0.184	0.187
H SD 03, cfs	0.006	0.007	0.008	0.009	0.009	0.010	0.011	0.012	0.012	0.013	0.014	0.014

Parameters:		Scenario 1	Scenario 2	Scenario 3	Units
Net steady pumping rate of well	Qw	0.25	0.25	0.25	cfs
Time pump on (pumping duration)	tpon	365	365	365	days
Perpendicular from well to stream	a	3100	3100	3100	ft
Well depth	d	270	270	270	ft

Section D: Well Construction

- Review of Well Construction
- Protection of the aquifer from contamination and co-mingling

D. WELL CONSTRUCTION, OAR 690-200

D1. **Well #:** _____ **Logid:** _____

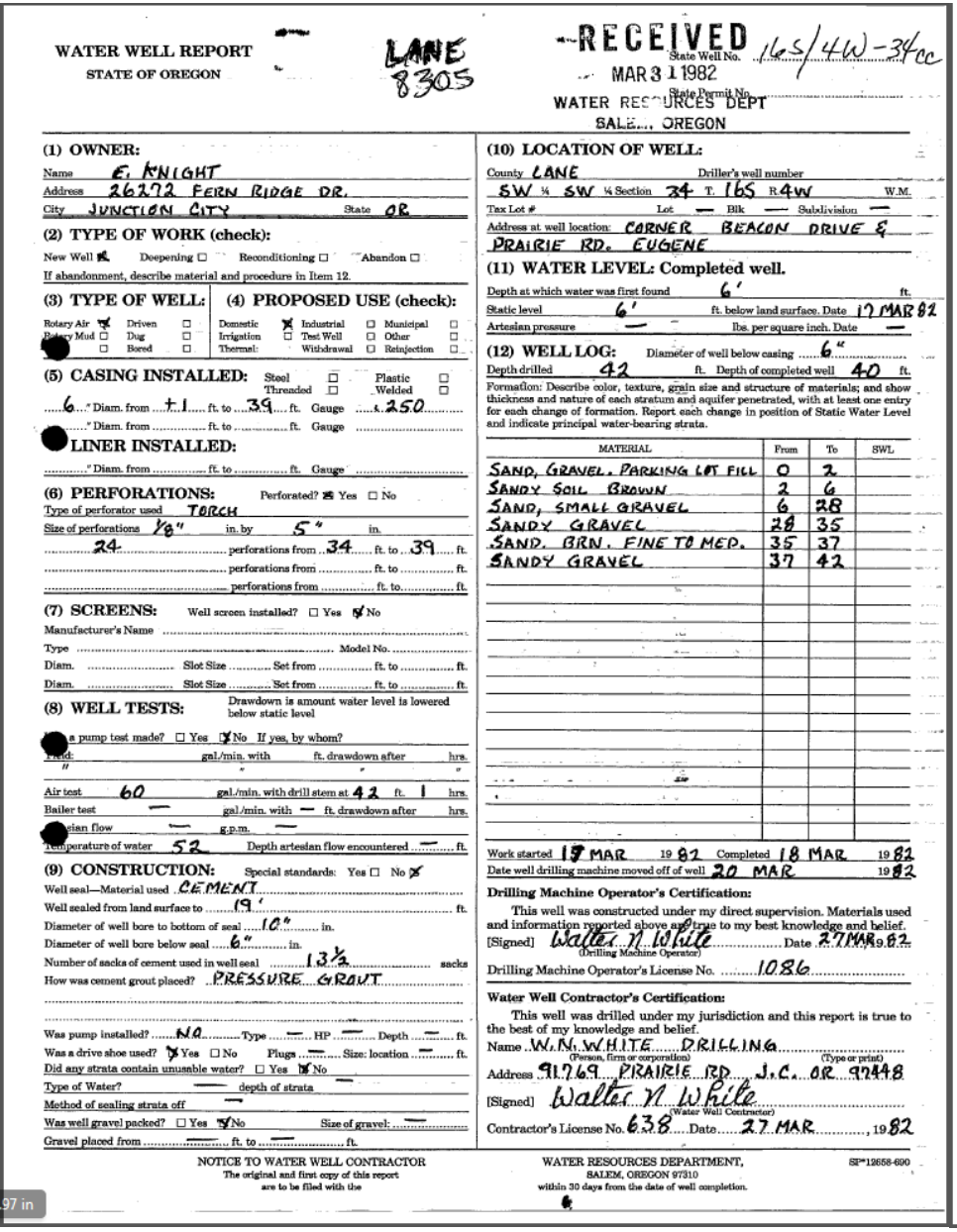
D2. **THE WELL does not appear to meet current well construction standards based upon:**

a. ☐ review of the well log;
b. ☐ field inspection by _____;
c. ☐ report of CWRE _____;
d. ☐ other: (specify) _____

D3. **THE WELL construction deficiency or other comment is described as follows:** _____

D4. ☐ **Route to the Well Construction and Compliance Section for a review of existing well construction.**

Section D: Well Construction



WATER WELL REPORT
STATE OF OREGON

LANE 8305

RECEIVED
State Well No. 16S/4W-34cc
MAR 31 1982
State Permit No.
WATER RESOURCES DEPT
SALEM, OREGON

(1) OWNER:
Name E. KNIGHT
Address 26272 FERN RIDGE DR.
City JUNCTION CITY State OR

(2) TYPE OF WORK (check):
New Well ☒ Deepening ☐ Reconditioning ☐ Abandon ☐
If abandonment, describe material and procedure in Item 12.

(3) TYPE OF WELL: (4) PROPOSED USE (check):
Rotary Air ☒ Driven ☐ | Domestic ☒ Industrial ☐ Municipal ☐
Rotary Mud ☐ Dug ☐ | Irrigation ☐ Test Well ☐ Other ☐
Cable ☐ Bored ☐ | Thermal: Withdrawal ☐ Reinjection ☐

(5) CASING INSTALLED: Steel ☐ Threaded ☐ Plastic ☐ Welded ☐
6" Diam. from +1 ft. to 39 ft. Gauge .250
" Diam. from ft. to ft. Gauge

LINER INSTALLED:
" Diam. from ft. to ft. Gauge

(6) PERFORATIONS: Perforated? ☒ Yes ☐ No
Type of perforator used TORCH
Size of perforations 1/8" in. by 5" in.
24 perforations from 34 ft. to 39 ft.
perforations from ft. to ft.
perforations from ft. to ft.

(7) SCREENS: Well screen installed? ☐ Yes ☒ No
Manufacturer's Name
Type Model No.
Diam. Slot Size Set from ft. to ft.
Diam. Slot Size Set from ft. to ft.

(8) WELL TESTS: Drawdown is amount water level is lowered below static level
Was a pump test made? ☐ Yes ☒ No If yes, by whom?
Yield: gal./min. with ft. drawdown after hrs.
" " " "
Air test 60 gal./min. with drill stem at 42 ft. 1 hrs.
Bailer test gal./min. with ft. drawdown after hrs.
Artesian flow g.p.m.
Temperature of water 52 Depth artesian flow encountered ft.

(9) CONSTRUCTION: Special standards: Yes ☐ No ☒
Well seal—Material used CEMENT
Well sealed from land surface to 19 ft.
Diameter of well bore to bottom of seal 10" in.
Diameter of well bore below seal 6" in.
Number of sacks of cement used in well seal 13½ sacks
How was cement grout placed? PRESSURE GROUT
Was pump installed? NA Type HP Depth ft.
Was a drive shoe used? ☒ Yes ☐ No Plugs Size: location ft.
Did any strata contain unusable water? ☐ Yes ☒ No
Type of Water? depth of strata
Method of sealing strata off
Was well gravel packed? ☐ Yes ☒ No Size of gravel:
Gravel placed from ft. to ft.

(10) LOCATION OF WELL:
County LANE Driller's well number
SW ¼ SW ¼ Section 34 T. 16S R 4W W.M.
Tax Lot # Lot — Blk — Subdivision —
Address at well location: CORNER BEACON DRIVE & PRAIRIE RD. EUGENE

(11) WATER LEVEL: Completed well.
Depth at which water was first found 6' ft.
Static level 6' ft. below land surface. Date 17 MAR 82
Artesian pressure — lbs. per square inch. Date

(12) WELL LOG: Diameter of well below casing 6"
Depth drilled 42 ft. Depth of completed well 40 ft.
Formation: Describe color, texture, grain size and structure of materials; and show thickness and nature of each stratum and aquifer penetrated, with at least one entry for each change of formation. Report each change in position of Static Water Level and indicate principal water-bearing strata.

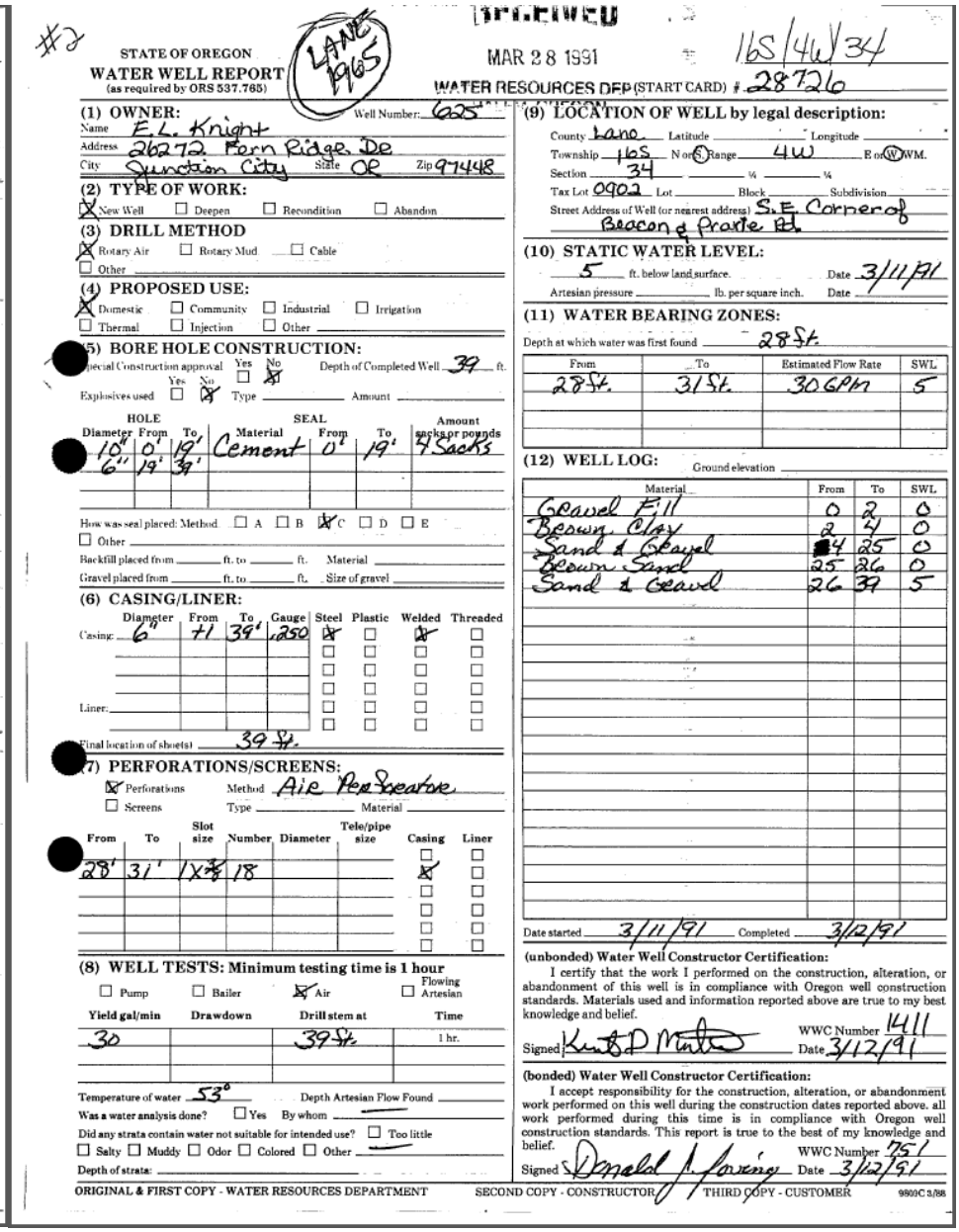
MATERIAL	From	To	SWL
SAND, GRAVEL, PARKING LOT FILL	0	2	
SANDY SOIL BROWN	2	6	
SAND, SMALL GRAVEL	6	28	
SANDY GRAVEL	28	35	
SAND, BRN. FINE TO MED.	35	37	
SANDY GRAVEL	37	42	

Work started 15 MAR 19 82 Completed 18 MAR 19 82
Date well drilling machine moved off of well 20 MAR 19 82

Drilling Machine Operator's Certification:
This well was constructed under my direct supervision. Materials used and information reported above are true to my best knowledge and belief.
[Signed] Walter N White (Drilling Machine Operator) Date 27 MAR 82
Drilling Machine Operator's License No. 1086

Water Well Contractor's Certification:
This well was drilled under my jurisdiction and this report is true to the best of my knowledge and belief.
Name W.N. WHITE DRILLING (Person, firm or corporation) (Type or print)
Address 91769 PRAIRIE RD. J.C. OR 97448
[Signed] Walter N White (Water Well Contractor)
Contractor's License No. 638 Date 27 MAR 19 82

NOTICE TO WATER WELL CONTRACTOR
The original and first copy of this report are to be filed with the
WATER RESOURCES DEPARTMENT, SALEM, OREGON 97310 within 30 days from the date of well completion.
SP*12658-690



#2

STATE OF OREGON
WATER WELL REPORT
(as required by ORS 537.765)

LANE 1965

RECEIVED
MAR 28 1991
WATER RESOURCES DEP

16S/4W/34
(START CARD) # 28726

(1) OWNER: Well Number: 625
Name E.L. Knight
Address 26272 Fern Ridge Dr.
City Junction City State OR Zip 97448

(2) TYPE OF WORK:
☒ New Well ☐ Deepen ☐ Recondition ☐ Abandon

(3) DRILL METHOD
☒ Rotary Air ☐ Rotary Mud ☐ Cable
☐ Other

(4) PROPOSED USE:
☒ Domestic ☐ Community ☐ Industrial ☐ Irrigation
☐ Thermal ☐ Injection ☐ Other

(5) BORE HOLE CONSTRUCTION:
Special Construction approval Yes ☐ No ☒ Depth of Completed Well 39 ft.
Explosives used Yes ☐ No ☒ Type Amount

HOLE Diameter	From	To	SEAL Material	From	To	Amount sacks or pounds
10"	0'	19'	Cement	0'	19'	4 Sacks
6"	19'	39'				

How was seal placed: Method ☐ A ☐ B ☒ C ☐ D ☐ E
☐ Other
Backfill placed from ft. to ft. Material
Gravel placed from ft. to ft. Size of gravel

(6) CASING/LINER:

	Diameter	From	To	Gauge	Steel	Plastic	Welded	Threaded
Casing:	6"	+1	39'	.250	☒	☐	☒	☐
					☐	☐	☐	☐
					☐	☐	☐	☐
Liner:					☐	☐	☐	☐
					☐	☐	☐	☐

Final location of shoe(s) 39 ft.

(7) PERFORATIONS/SCREENS:
☒ Perforations Method Air Percussion
☐ Screens Type Material

From	To	Slot size	Number	Diameter	Tele/pipe size	Casing	Liner
28'	31'	1/8"	18			☒	☐
						☐	☐
						☐	☐
						☐	☐
						☐	☐

(8) WELL TESTS: Minimum testing time is 1 hour
☐ Pump ☐ Bailer ☒ Air ☐ Flowing Artesian

Yield gal/min	Drawdown	Drill stem at	Time
30		39 ft.	1 hr.

Temperature of water 53° Depth Artesian Flow Found
Was a water analysis done? ☐ Yes By whom
Did any strata contain water not suitable for intended use? ☐ Too little
☐ Salty ☐ Muddy ☐ Odor ☐ Colored ☐ Other
Depth of strata:

(9) LOCATION OF WELL by legal description:
County Lane Latitude Longitude
Township 16S N or (S) Range 4W E or (W) WM.
Section 34 ¼ ¼
Tax Lot 0902 Lot Block Subdivision
Street Address of Well (or nearest address) S.E. Corner of Beacon & Prairie Rd.

(10) STATIC WATER LEVEL:
5 ft. below land surface. Date 3/11/91
Artesian pressure lb. per square inch. Date

(11) WATER BEARING ZONES:
Depth at which water was first found 28 ft.

From	To	Estimated Flow Rate	SWL
28 ft.	31 ft.	30 GPM	5

(12) WELL LOG: Ground elevation

Material	From	To	SWL
Gravel Fill	0	2	0
Brown Clay	2	4	0
Sand & Gravel	4	25	0
Brown Sand	25	26	0
Sand & Gravel	26	39	5

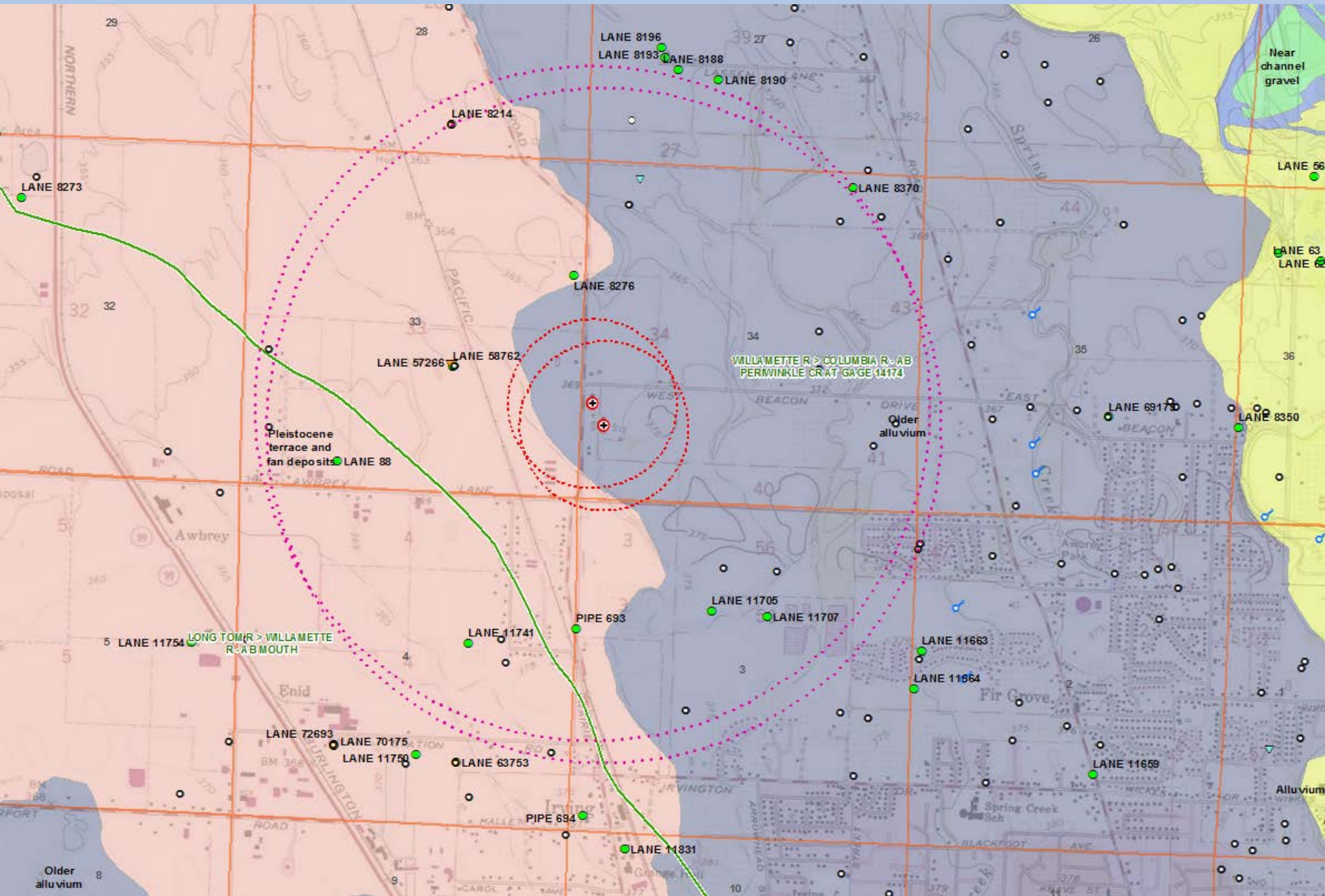
Date started 3/11/91 Completed 3/12/91

(unbonded) Water Well Constructor Certification:
I certify that the work I performed on the construction, alteration, or abandonment of this well is in compliance with Oregon well construction standards. Materials used and information reported above are true to my best knowledge and belief.
Signed [signature] WWC Number 1411
Date 3/12/91

(bonded) Water Well Constructor Certification:
I accept responsibility for the construction, alteration, or abandonment work performed on this well during the construction dates reported above. all work performed during this time is in compliance with Oregon well construction standards. This report is true to the best of my knowledge and belief.
Signed Donald J. Loving WWC Number 751
Date 3/12/91

ORIGINAL & FIRST COPY - WATER RESOURCES DEPARTMENT SECOND COPY - CONSTRUCTOR THIRD COPY - CUSTOMER
9809C 3/88

Summary


LANE 8196
LANE 8193
LANE 8188
LANE 8190
LANE 8214
LANE 8273
LANE 8370
LANE 8276
LANE 57266
LANE 58762
WILLAMETTE R > COLUMBIA R - AB PERIWINKLE CRAT GAGE 14174
Pleistocene terrace and fan deposits
LANE 88
Older alluvium
LANE 8350
Near channel gravel
LANE 11705
LANE 11707
PIPE 693
LANE 11741
LANE 11754
LONG TOM R > WILLAMETTE R - AB MOUTH
LANE 11663
LANE 11664
LANE 72693
LANE 70175
LANE 11750
LANE 63753
LANE 11659
PIPE 694
LANE 11831
Alluvium
Older alluvium
Awbrey
Enid
Fir Grove
Irving
Spring Creek Sch


Thank You